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## New Species and Nomenclatural Notes in Mesoamerican *Ardisia* (Myrsinaceae)

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**ABSTRACT.** Taxonomic study of the Myrsinaceae for the *Flora Mesoamericana* treatment resulted in the discovery of three new species from Panama, which are described and illustrated: *Ardisia herreraana* Pipoly & Ricketson of subgenus *Ardisia*, and *A. nana* Pipoly & Ricketson and *A. pseudocuspidata* Pipoly & Ricketson, both of subgenus *Icacorea*. In addition, two new combinations within *Ardisia* subg. *Icacorea* are made: *Ardisia mexicana* subsp. *siltepecana* (Lundell) Pipoly & Ricketson and *Ardisia furfuracella* subsp. *veraguasensis* (Lundell) Pipoly & Ricketson, the latter with two heterotypic binomials newly relegated to synonymy (*A. oerstediana* Lundell and *A. caudatifolia* Lundell). Finally, we lectotypify *Ardisia compressa* Kunth var. *mexicana* Oersted, a new taxonomic synonym, and place *A. jaliscensis* Lundell into synonymy of *A. mexicana* Lundell subsp. *mexicana*.

**RESUMEN.** El estudio taxonómico de la familia Myrsinaceae para el proyecto *Flora Mesoamericana* resultó en el descubrimiento de tres nuevas especies panameñas las cuales se describen e ilustran: *Ardisia herreraana* Pipoly & Ricketson del subgénero *Ardisia*, *A. nana* Pipoly & Ricketson y *A. pseudocuspidata* Pipoly & Ricketson, ambas del subgénero *Icacorea*. Además, se proponen dos combinaciones nuevas dentro de *Ardisia* subg. *Icacorea*: *Ardisia mexicana* subsp. *siltepecana* (Lundell) Pipoly & Ricketson y *Ardisia furfuracella* subsp. *veraguasensis* (Lundell) Pipoly & Ricketson, y como novedad se relega a la sinonimia de la última subespecie a dos binomios heterotípicos (*A. oerstediana* Lundell y *A. caudatifolia* Lundell). Finalmente, se lectotipifica *Ardisia compressa* Kunth var. *mexicana* Oersted, un nuevo sinónimo taxonómico, y se ubica a *A. jaliscensis* Lundell como sinónimo de *A. mexicana* Lundell.

*Key words:* *Ardisia*, *Ardisia* subg. *Ardisia*, *Ar-*

*disia* subg. *Icacorea*, conservation assessment, *Flora Mesoamericana*, lectotypifications, Mexico, Myrsinaceae, Panama.

The pantropical genus *Ardisia* Swartz is the largest in the family Myrsinaceae, containing perhaps as many as 500 species (Chen & Pipoly, 1996). Its circumscription has been problematic due to the lack of a comprehensive treatment since that of Mez (1902). The genus has traditionally been separated from all others in the Myrsinaceae by what he interpreted as free filaments, and by pluriseriate ovules (Mez, 1902). Pipoly and Ricketson (1998) found that the stamens in all subgenera are actually connate basally by their filaments to form a hyaline, inconspicuous tube, but that the tube is free from the corolla. The hyaline staminal tube, free from the corolla tube, is the only unique characteristic that distinguishes *Ardisia* from the other genera of the family, and thus defines it.

While preparing the taxonomic treatment of *Ardisia* for inclusion in the Myrsinaceae for *Flora Mesoamericana*, one new species was discovered within *Ardisia* subg. *Ardisia* and two additional ones from subgenus *Icacorea* (Aublet) Mez. Also, two new combinations were found to be needed, and three binomials are relegated to synonymy. Finally, while working up the synonymy for *Ardisia mexicana*, it was determined that one of its newly proposed taxonomic synonyms, *A. compressa* var. *mexicana*, needed to be lectotypified.

### ***Ardisia* Swartz subg. *Ardisia***

*Ardisia* subg. *Ardisia*, as will be circumscribed in the upcoming *Flora Mesoamericana* treatment, comprises 11 species in Mesoamerica. Members of this group are mostly locally common, occur in forest margins and survive moderate levels of disturbance (Pipoly, unpublished), and their ripe black

to purple-black fruits provide a large food source for birds, as well as the humans that live in their

habitats. They are easily propagated by cuttings (Grijalva, pers. comm.).

KEY TO MESOAMERICAN *ARDISIA* SUBG. *ARDISIA*

- 1a. Pedicels covered with minute papillae, or simple multicellular trichomes.
  - 2a. Calyx lobes 2.5 mm or longer . . . . . *A. herrerana* Pipoly & Ricketson
  - 2b. Calyx lobes smaller, less than 2.2 mm.
    - 3a. Pedicels of mature flowers 0–3 mm . . . . . *A. bracteosa* A. DC.
    - 3b. Pedicels of mature flowers longer, slender, 4–7 mm.
      - 4a. Leaf blades coriaceous, generally over 10 cm; pistil 6.1–6.8 mm, the ovary 1.4–1.6 mm, the styles 4.5–5.2 mm; mature fruits 3–5 mm diam . . . . . *A. revoluta* Kunth
      - 4b. Leaf blades chartaceous, generally under 10 cm; pistil 7–8.4 mm, the ovary 1.6–2 mm, the styles 6.4–6.6 mm; mature fruits 5–7 mm diam . . . . . *A. escallonoides* Schlechtendal & Chamisso
- 1b. Pedicels glabrous.
  - 5a. Base of peduncle and apex of the branchlet with minute, dense papillae, and/or with simple multicellular trichomes.
    - 6a. Inflorescence as long as or longer than the leaves; pedicels 6.2–12.4 mm . . . . . *A. colombiana* Lundell
    - 6b. Inflorescence much shorter than the leaves; pedicels 0–4.5 mm . . . . . *A. granatensis* Mez
  - 5b. Base of peduncle and apex of the branchlet glabrous.
    - 7a. Anthers versatile, 1.5–1.6 × 0.4–0.5 mm . . . . . *A. breedlovei* Lundell
    - 7b. Anthers basifixed, more than 2 × 0.6 mm.
      - 8a. Pedicels of mature flowers or fruits more than 6 mm . . . . . *A. paschalis* Donnell Smith
      - 8b. Pedicels of mature flowers or fruits 0–6 mm.
        - 9a. Leaf blades membranaceous, 2.8–3.6 cm; flowers small, calyx lobes 1.3–1.6 mm, essentially epunctate; corolla lobes 2.9–3.1 mm; stamens 2.4–2.5 mm, anthers 2.3–2.5 mm . . . . . *A. escuintlensis* Lundell
        - 9b. Leaf blades chartaceous to coriaceous, 3.8–11.7 cm; flowers larger, calyx lobes 3.2–7.5 mm, punctate; corolla lobes 6.7–12.8 mm; stamens 6.9–11.2 mm, anthers 2.8–6.9 mm.
          - 10a. Calyx lobes 3.2–6.2 mm; corolla lobes 6.7–10 mm, the corolla tube 2–4.7 mm; the anthers 2.8–5.4 mm × 1.1–1.9 mm . . . . . *A. foetida* Willdenow ex Roemer & Schultes
          - 10b. Calyx lobes 7–7.5 mm; corolla lobes 12.2–12.8 mm, the corolla tube 1–1.2 mm; the anthers 6.6–6.9 mm × 1.9–2.2 mm . . . . . *A. perinsignis* Lundell

**1. *Ardisia herrerana*** Pipoly & Ricketson, sp. nov. TYPE: Panama. Darién: Parque Nacional Darién, trail between Estación Pirré and Cerro Pirré, 08°00'N, 077°45'W, 100–300 m, 11 Feb 1991 (fl, fr), *H. Herrera* 945 (holotype, MO; isotypes, F, FTG, PMA not seen). Figure 1.

Haec species quoad folia magna pedicellos papilloso-tomentosos atque lobulos calycinis magnos *A. cabreræ* arcte affinis, sed ab ea laminis foliaribus chartaceis (non coriaceis) ad apices acutis (nec acuminatis), inflorescentiarum pinnatarum (non bipinnatarum) ramulis 20 ad 40 (nec 7 ad 11)-floribus, pedicellis 5.3–7.3 (nec 2.4–5) mm longis, lobulis calycinis 3.1–3.4 mm (non 2.7–2.9) mm longis ad apices rotundatis (nec obtusis), lobulis corollinis ellipticis usque lanceolatis (non ovatis) 5.8–6.3 × 2.6–2.9 (non 4.3–4.5 × 3.4–3.5) mm, staminibus 6.4–6.7 (non 3.5–3.7) mm longis, denique antheris 1.7–1.9 (non 1.1–1.2) mm latis statim separabilis.

*Trees* to 9 m tall. *Branchlets* slender, terete, 6–8 mm diam., densely and minutely papillose, with scattered to dense, prominent lenticels. *Leaves* with blades chartaceous, oblong, elliptic, or oblanceolate, 27–35 × 9.5–11.2 cm, apically acute, the acumen 0.5–1.3 mm long, basally cuneate, decurrent on the petiole, inconspicuously punctate and

punctate-lineate, glabrous, the midrib impressed above, prominently raised below, the secondary veins 52 to 70 pairs, prominulous above and below, the margins entire, flat; petioles slender, marginate, 2.5–3 cm long, glabrous except often densely and minutely papillose basally. *Inflorescence* terminal, a pinnate panicle of racemes, 20–27 × 13–17 cm, usually shorter than the leaves, densely and minutely papillose, the branches bearing 20 to 40 flowers each; the peduncle 1.3–5.2 cm long, the lower branches subtended by leaves, densely and minutely papillose or with minute simple multicellular trichomes; inflorescence primary bract and branch bracts unknown (only scars visible); secondary branches 0.9–2.6 cm long; floral bracts caducous, membranous, ovate, 9–21 × 7–15 mm, apically acute, prominently punctate and punctate-lineate, glabrous within, densely and minutely papillose or with minute simple multicellular trichomes without, the margins entire, hyaline, sparsely glandular-ciliolate; pedicels slender, terete, 5.3–7.3 mm long, inconspicuously punctate and punctate-lineate, densely and minutely papillose or with minute simple multicellular trichomes.



Figure 1. *Ardisia herrerana* Pipoly & Ricketson. —A. Flowering branch. —B. Flower. —C. Detail of stamen and petal, showing dense yellow papillae. —D. Fruit. A–D drawn from the holotype, *H. Herrera* 945 (MO).

*Flowers* 5-merous; calyx lobes chartaceous, ovate, 3.1–3.4 × 3.2–3.5 mm, apically rounded, conspicuously punctate and punctate-lineate, glabrous except with sparse minute cupulate scales within, the

margins entire, hyaline, sparsely ciliolate; corolla white, membranous, 8.4–8.7 mm long, the tube 2.4–2.6 mm long, the lobes elliptic to lanceolate, 5.8–6.3 × 2.6–2.9 mm, apically acute to rounded,

conspicuously punctate and punctate-lineate, glabrous except with dense yellow papillae basally within, the margins entire, hyaline; stamens 6.4–6.7 mm long, the filaments 4–4.2 mm long, the staminal tube 1.4–1.7 mm long, the apically free portion 2.4–2.6 mm long, inconspicuously punctate and punctate-lineate, glabrous, the anthers free, lanceolate, 2.2–2.5 × 1.7–1.9 mm, apically apiculate, basally subcordate, the connective inconspicuously punctate; pistil unknown. *Fruit* (immature) green, globose, 3.5–5.5 mm diam., conspicuously and prominently punctate and punctate-lineate.

*Distribution.* *Ardisia herrerana* is endemic to the Parque Nacional Darién, on Cerro Pirré in Darién Province, Panama, growing from 100 to 300 m elevation.

*Ecology and conservation assessment.* *Ardisia herrerana* is an apparent point endemic. There have been a number of large-scale botanical expeditions to Cerro Pirré, and the existence of only one collection points to the species' rarity. According to IUCN (2001) Red List criteria, this species would be critically endangered (CRB2aD), owing to (B) area of occupancy estimated to be less than 10 km<sup>2</sup> and (2a) known only from one collection, so (D) the total population size estimated at less than 50 mature individuals. Although *A. herrerana* occurs in Parque Nacional Darién, and its remote location reduces threat, there remains the possibility of threat from unforeseen factors (treefalls, storms, etc.).

*Etymology.* This taxon is named for Heraclio Herrera, its collector.

*Ardisia herrerana* belongs to *Ardisia* subg. *Ardisia*, which is circumscribed by racemose to spicate inflorescence branches; calyx lobes symmetrical, longer than wide, and not auriculate basally, glandular-granulose adaxially at the base, and without a subapical notch along the margin. *Ardisia herrerana* could initially be confused with the common species *A. revoluta* by its general leaf shape, size, and large inflorescence. However, *Ardisia herrerana* is easily distinguished from *A. revoluta* by its mi-

nutely papillose (not glabrous) branchlets; calyx lobes chartaceous (not membranaceous), 3.1–3.4 × 3.2–3.5 (not 1.9–2.1 × 1.6–1.8) mm, apically rounded (not acute); corolla 8.4–8.7 (not 7.4–7.8) mm long, and by its stamens 6.4–6.7 (not 5.1–5.3) mm long.

*Ardisia herrerana* is most similar to *A. cabreræ* Pipoly because of its large leaves, long pedicels that are densely covered with minute papillae and/or simple multicellular trichomes, and the large calyx lobes. However, *A. herrerana* differs from *A. cabreræ* by its chartaceous (not coriaceous) and apically acute (not acuminate) leaf blades, its pinnate (not bipinnate) inflorescence, its inflorescence branches with 20 to 40 flowers (not 7 to 11), its pedicels 5.3–7.3 (not 2.4–5) mm long, its calyx lobes 3.1–3.4 (not 2.7–2.9) mm long, and apically rounded (not obtuse), its corolla lobes elliptic or lanceolate (not ovate) and 5.8–6.3 × 2.6–2.9 (not 4.3–4.5 × 3.4–3.5) mm, its stamens 6.4–6.7 (not 3.5–3.7) mm long, and its anthers 1.7–1.9 (not 1.1–1.2) mm wide.

**Ardisia** Swartz subg. **Icacorea** (Aublet) Mez

*Ardisia* subg. *Icacorea*, as will be circumscribed in the upcoming *Flora Mesoamericana* treatment, comprises 31 species with 33 taxa in Mesoamerica. Of these, 12 are widespread, highly variable forest margin and gap species, with extensive quantitative plasticity in morphological characters that has led to much taxonomic over-description. Members of this group are mostly locally common, and because they produce so many bright red fruits per panicle, they provide a large food source for birds. They have broad ecological tolerance, and thus would be suitable for early introduction in any forest restoration effort.

The key below includes the new species and presents our revised circumscriptions of *Ardisia furfuracella* and *A. mexicana*. Vegetative or fruiting calyx characters are used whenever possible to facilitate identification, because the majority of herbarium specimens are in fruit. Terminology used here follows that of Ricketson and Pipoly (2003).

KEY TO MESOAMERICAN *ARDISIA* SUBG. *ICACOREA*

- 1a. Inflorescences axillary and terminal (sometimes apparently terminal, but with axillary inflorescence buds easily visible).
  - 2a. Leaf margins entire.
    - 3a. Leaf apex short-acuminate to subacuminate, the base acute and decurrent on the petiole, but not to its base; branchlets without interpetiolar ridges or angles.
      - 4a. Branchlets, leaves, and inflorescences glabrous; anthers 3.2–3.4 mm long; styles 4.1–4.3 mm long . . . . . *A. alajuelæ* (Lundell) Pipoly & Ricketson
      - 4b. Branchlets, leaves, and inflorescences furfuraceous-lepidote; anthers 2.8–3.2 mm long; styles 4.4–5.2 mm long . . . . . *A. hintonii* Lundell

- 3b. Leaf apex long-acuminate to caudate or cuspidate, the base cuneate, rounded or obtuse, and decurrent on the petiole to its base; branchlets with sharp angles or interpetiolar ridges.
- 5a. Leaf decurrent to petiole base and on stem; branchlets with interpetiolar ridges.
- 6a. Leaf blades coriaceous, apically acuminate but not caudate; petioles canaliculate; calyx lobes 1.2–2.2 mm wide; corolla lobes 4.5–6 × 2–2.4 mm . . . . . *A. fendleri* Lundell
- 6b. Leaf blades membranous to chartaceous, apically caudate; petioles marginate; calyx lobes 0.5–1.2 mm wide; corolla lobes 2.9–4.6 × 1.6–2.1 mm . . . . . *A. furfuracella* Standley
- 7a. Leaf blades membranous, essentially glabrous below, except sparsely to densely and minutely furfuraceous-lepidote along the midrib; pedicels glabrous; calyx lobes 1.4–1.6 × 1–1.3 mm; corolla lobes 4.4–4.6 × 1.7–2.1 mm; anthers 2.2–3.1 mm long; styles 4.7–5.3 mm long . . . . .  
. . . . . *A. furfuracella* subsp. *veraguasensis* (Lundell) Pipoly & Ricketson
- 7b. Leaf blades chartaceous, sparsely and minutely furfuraceous-lepidote below, the scales denser along the midrib; pedicels with scattered, minute furfuraceous-lepidote indument; calyx lobes 0.9–1.2 × 0.5–1 mm; corolla 2.9–3.2 × 1.6–1.8 mm; anthers 1.6–1.9 mm long; styles 3.6–3.9 mm long . . . . .  
. . . . . *A. furfuracella* Standley subsp. *furfuracella*
- 5b. Leaf base decurrent to petiole base, but not on stem; branchlets with angles, but without interpetiolar ridges.
- 8a. Leaf blades chartaceous, basally cuneate; calyx lobes 1.3–1.5 × 1.1–1.3 mm; styles 4.6–5.3 mm long . . . . . *A. brevis* Lundell
- 8b. Leaf blades membranous, basally obtuse to rounded; calyx lobes 1–1.3 × 0.8–1.1 mm; styles 2.9–3.8 mm long.
- 9a. Corolla lobes 2.3–2.6 × 1.1–1.4 mm; anthers 1.4–1.6 × 0.5–0.7 mm; styles 2.9–3.2 mm long; fruits 3.5–4.5 mm diam.; Cocos Island . . . . . *A. cuspidata* Benth
- 9b. Corolla lobes 3.2–3.5 × 1.7–1.9 mm; anthers 1.8–2 × 0.7–0.9 mm; styles 3.5–3.8 mm long; fruits 5–6 mm diam.; southern Darién/northern Chocó . . . . .  
. . . . . *A. pseudocuspidata* Pipoly & Ricketson
- 2b. Leaf margins undulate, crenulate, dentate or serrate.
- 10a. Flowers 4- or 5-merous in the same inflorescence . . . . . *A. guianensis* (Aublet) Mez
- 10b. Flowers strictly 5-merous.
- 11a. Corolla lobes 4.9–6.2 mm long; anthers 3.7–4.4 mm long; Mexico to Guatemala . . . . .  
. . . . . *A. mexicana* Lundell
- 12a. Calyx lobes 1.2–1.4 mm long, apically acute; corolla lobes 6–6.2 mm long; anthers 4.1–4.4 × 0.6–0.8 mm; styles 6–6.2 mm long . . . . . *A. mexicana* Lundell subsp. *mexicana*
- 12b. Calyx lobes 0.9–1.2 mm long, apically rounded; corolla lobes 4.9–5.2 mm long; anthers 3.7–3.9 × 1.8–2 mm; styles 4.9–5.3 mm long . . . . .  
. . . . . *A. mexicana* subsp. *siltepecana* (Lundell) Pipoly & Ricketson
- 11b. Corolla lobes 3.8–4.3 mm long; anthers 2.2–2.8 mm long; Nicaragua to Panama.
- 13a. Leaf margins serrate-dentate; calyx lobes 1.3–1.4 × 1.2–1.4 mm; anthers 2.2–2.4 mm long . . . . . *A. longicaudata* Lundell
- 13b. Leaf margins undulate to crenulate; calyx lobes 1–1.3 × 0.6–0.8 mm; anthers 2.4–2.8 mm long . . . . . *A. fruticosa* Lundell
- 1b. Inflorescences strictly terminal, with no axillary buds visible at nodes below.
- 14a. Inflorescence a compact, ovoid capitulum . . . . . *A. glomeriflora* J. F. Morales
- 14b. Inflorescence an open panicle.
- 15a. Leaf margins undulate, crenulate, serrate or dentate.
- 16a. Styles 3.5–4.5 mm long.
- 17a. Ultimate branches of inflorescence racemose; calyx lobes 1.3–1.5 mm long; corolla lobes 4.4–4.7 × 2–2.2 mm; anthers 2.9–3.1 mm long . . . . . *A. geniculata* Lundell
- 17b. Ultimate branches of inflorescence corymbose; calyx lobes 0.9–1.3 mm long; corolla lobes 3.7–4.2 × 1.5–1.9 mm; anthers 1.9–2.5 mm long.
- 18a. Branchlets with conspicuous interpetiolar ridges; styles 4.2–4.5 mm long . . . . .  
. . . . . *A. amanuensis* Lundell
- 18b. Branchlets terete or angled, without interpetiolar ridges; styles 3.5–3.8 mm long . . . . .  
. . . . . *A. irasuensis* Oersted
- 16b. Styles 5.4–6.1 mm long.
- 19a. Inflorescences 2.5–3.2 × 0.9–1.5 cm; calyx lobes 0.9–1 mm wide . . . . . *A. cookii* Lundell
- 19b. Inflorescences 4–24 × 3–21 cm; calyx lobes 1–1.3 mm wide.
- 20a. Anthers 2.9–3.2 mm long; styles 5.9–6.1 mm long . . . . . *A. subcrenulata* Lundell
- 20b. Anthers 3.4–4 mm long; styles 5.4–5.9 mm long . . . . . *A. compressa* Kunth
- 15b. Leaf margins entire.
- 21a. Leaf blades membranous to chartaceous.
- 22a. Calyx lobes 0.6–0.8 × 0.6–0.8 mm; corolla lobes 3–3.4 × 1.7–1.9 mm; anthers 1.5–1.6 mm long, oblong . . . . . *A. scheryi* Lundell
- 22b. Calyx lobes 1–2.3 × 1–2.2 mm; corolla lobes 4.3–7.1 × 1.9–2.7 mm; anthers 2.8–4.8 mm long, lanceolate.

- 23a. Leaf blades apically obtuse to subacuminate; calyx lobes 1.7–2.3 × 1.7–2.2 mm; styles 6.8–8.8 mm long . . . . . *A. maxonii* Standley
- 23b. Leaf blades apically acute to acuminate; calyx lobes 1–1.5 × 1–1.3 mm; styles 4.8–5.9 mm long.
- 24a. Calyx lobes 1.4–1.5 mm; corolla lobes 2.4–2.5 mm long; anthers 2.8–3 mm long; style 4.8–4.9 mm long; petioles 0.3–0.8 cm long . . . . . *A. storkii* Lundell
- 24b. Calyx lobes 1–1.4 mm long; corolla lobes 3.4–4 mm long; anthers 3.4–4 mm long; style 5.4–5.9 mm long; petioles 0.6–1.6 cm long . . . . .  
. . . . . *A. compressa* Kunth
- 21b. Leaf blades subcoriaceous to coriaceous.
- 25a. Leaf blades decurrent to petiole base and on branchlets, the branchlets with prominent interpetiolar ridges.
- 26a. Flowers 4-merous; calyx lobes 1–1.2 × 0.6–0.7 mm; corolla lobes 3–3.2 mm long; anthers 0.5–0.6 mm wide; styles 3.6–3.7 mm long . . . . .  
. . . . . *A. nana* Pipoly & Ricketson
- 26b. Flowers 5-merous; calyx lobes 1.2–2.9 × 1.1–2 mm; corolla lobes 4.5–6.5 mm long; anthers 0.9–1.2 mm wide; styles 5–6.9 mm long.
- 27a. Branchlets and inflorescence rachis glabrous; petioles absent or to 0.5 cm long, slender; calyx lobes 2.5–2.9 × 1.5–2 mm; corolla lobes 2.3–2.5 mm wide; styles 6.3–6.9 mm long . . . . . *A. subsessilifolia* Lundell
- 27b. Branchlets and inflorescence rachis with scattered, minute furfuraceous-lepidote indument at least apically, usually glabrescent with age; petioles absent or to 2.2 cm long, stout; calyx lobes 1.2–2.2 × 1.1–1.5 mm; corolla lobes 1.5–2.2 mm wide; styles 5–6.1 mm long . . . . . *A. copeyana* Standley
- 25b. Leaf blades decurrent only to petiole base; branchlets without interpetiolar ridges.
- 28a. Branchlets terete.
- 29a. Calyx lobes 1.3–1.5 mm long; corolla lobes 1.6–1.8 mm wide; anthers 0.8–0.9 mm wide; styles 5.8–6.1 mm long . . . . . *A. rigidifolia* Lundell
- 29b. Calyx lobes 1.1–1.3 mm long; corolla lobes 1.9–2.1 mm wide; anthers 1–1.1 mm wide; styles 4.3–4.5 mm long . . . . . *A. jefeana* Lundell
- 28b. Branchlets angulate.
- 30a. Anthers 2–2.2 × 0.7–0.8 mm; stamens 3.8–4 mm long; pedicels 3–4.5 mm long; inflorescences 4–7 cm long; leaf blades short-acuminate, inconspicuously punctate and punctate-lineate . . . . . *A. guancheana* Lundell
- 30b. Anthers 2.3–4.4 × 0.8–1.2 mm; stamens 4.1–7.3 mm long; pedicels 5–8 mm long; inflorescences 9–14 cm long; leaf blades short-acute to -acuminate, conspicuously and prominently punctate and punctate-lineate . . . . .  
. . . . . *A. costaricensis* Lundell

**1. *Ardisia nana* Pipoly & Ricketson, sp. nov.**

TYPE: Panama. Panamá: Cabecera del Río Piradi, 09°11'05"N, 078°16'00"W, 100–150 m, 13 June 1994 (fl), *H. Herrera* 1627 (holotype, MO; isotypes, F, FTG, MO, PMA not seen, STRI not seen). Figure 2.

Haec species ob petiolos ad ramulos decurrentes, ramulos inter petiolos-porcatos, laminas foliarias subcoriaceas vel coriaceas *A. subsessilifoliae* et *A. copeyanae* arcte affinis, sed ab eis floribus 4- (non 5-) meris, lobulis calycinis 1.0–1.2 × 0.6–0.7 (non 1.2–2.9 × 1.1–2.0) mm longis, lobulis corollinis 3.0–3.2 (non 4.5–6.5) mm longis, antheris 0.5–0.6 (non 0.9–1.2) mm latis, denique stylis 3.6–3.7 (non 5.0–5.9) mm longis statim separabilis.

*Shrubs* to 1 m tall. *Branchlets* slender, angulate, 2–4 mm diam., densely and minutely furfuraceous-lepidote at least apically, usually glabrescent with age, with prominent interpetiolar ridges. *Leaves* with blades subcoriaceous, elliptic or oblong to oblanceolate, 3–10.1 × 0.9–2.1 cm, apically acute to acuminate, the acumen 8–12 mm long, basally acute to cuneate, decurrent on the petiole and con-

tinuous with the interpetiolar ridges, inconspicuously punctate and punctate-lineate, glabrous above, with scattered, minute furfuraceous-lepidote indument below, glabrous along the midrib, the secondary veins 16 to 24 pairs, the margins entire, flat; petioles slender, marginate, 0.3–0.5 cm long, glabrous. *Inflorescence* terminal, erect, bipinnately to tripinnately paniculate, 4–5 × 3–3.5 cm, pyramidal, shorter than the leaves, densely and minutely furfuraceous-lepidote, the branches loosely congested into 3- to 9-flowered corymbs; peduncles 2–5 mm long; inflorescence branch bracts caducous, membranous, ovate to oblong, 1.5–2 × 0.6–0.9 mm, apically acute, prominently punctate and punctate-lineate, glabrous, the margins minutely erose, hyaline; floral bracts similar to the inflorescence branch bracts but ovate, 0.6–0.8 × 0.4–0.5 mm; pedicels slender, terete, 4–5 mm long, prominently punctate and punctate-lineate, glabrous. *Flowers* 4-merous; calyx 1.3–1.5 mm long, the tube 0.2–0.3 mm long, the lobes ovate, 1–1.2 × 0.6–0.7 mm, apically acute to rounded, conspicuously and

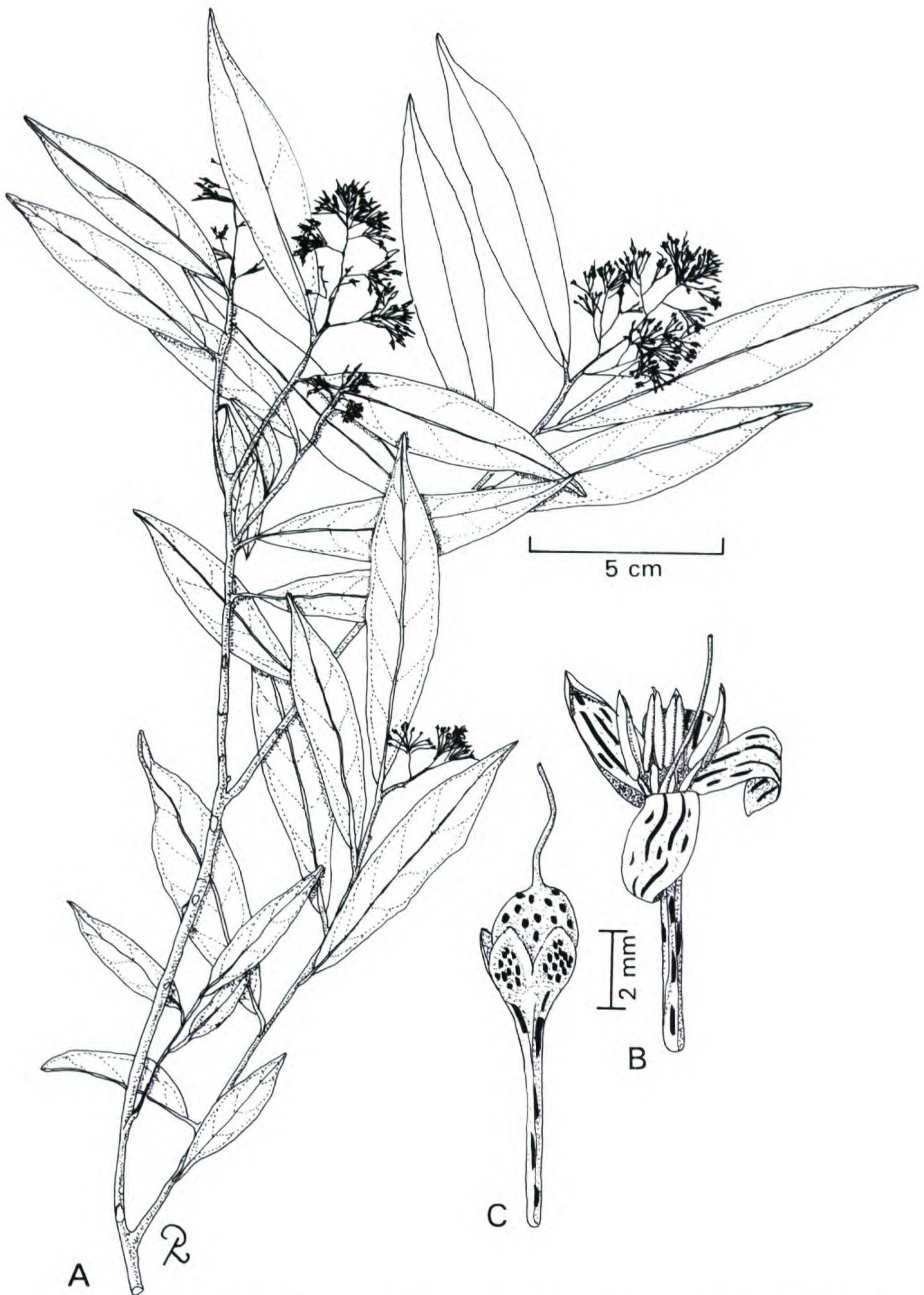


Figure 2. *Ardisia nana* Pipoly & Ricketson. —A. Flowering branch. —B. Flower. —C. Fruit. A–C drawn from the holotype, *H. Herrera 1627* (MO).

prominently punctate and punctate-lineate, glabrous, the margins minutely erose, hyaline; corolla white, 4.2–4.3 mm long, the tube 1–1.2 mm long, the lobes lanceolate, 3–3.2 × 1.5–1.7 mm, apically

acute, prominently punctate and punctate-lineate, glabrous, the margins entire; stamens 3.5–3.7 mm long, the filaments 1.7–1.8 mm long, the staminal tube 0.3–0.5 mm long, the apically free portion

1.2–1.5 mm long, epunctate, glabrous, the anthers free, lanceolate,  $2.1\text{--}2.2 \times 0.5\text{--}0.6$  mm, apically apiculate, basally subcordate, the connective inconspicuously punctate; pistil 4.4–4.6 mm long, glabrous, the ovary ovoid, 0.6–0.7 mm long, the style 3.6–3.7 mm long, epunctate, the ovules 7 to 9. *Fruits* unknown.

*Distribution.* *Ardisia nana* is endemic to the Río Piriadi area in the province of Panamá, Panama, from 100 to 150 m elevation.

*Ecology and conservation assessment.* This species occurs in the unnamed valley that forms the drainage basin of Lago Bayamo and Río Chepo. It houses tropical wet forest facing the Pacific, where the Chocó Floristic Province of Panama, Colombia, and Ecuador has its northernmost extension. The valley is just east of where the Pan American Highway ends, so threats to the area owing to timber harvest and settlement are much less than they are farther westward. The species' extent of occurrence, based on availability of suitable habitat, is approximately 4150 km<sup>2</sup>, and the known area of occupancy is less than 1 km<sup>2</sup>. Therefore, we regard this species as Endangered, ENB1aD, sensu the IUCN Red List criteria (IUCN, 2001). The Endangered status was determined based on the fact that the (B1) extent of occurrence is less than 5000 km<sup>2</sup>, (a) known from less than five locations, and (D) the population size is estimated at fewer than 250 individuals. It is significant that the type collection was gathered from one of the most heavily collected areas of Panama, so we can be relatively certain that it is at least a rare species in terms of number of individuals per hectare.

*Etymology.* The epithet comes from the Latin word "nana," meaning dwarf, referring to the small leaves and flowers.

The decurrent leaf bases running to interpetiolar ridges, and subcoriaceous to coriaceous leaf blades indicate that *Ardisia nana* is close to *A. subsessilifolia* and *A. copeyana*. However, *A. nana* is immediately separable from the latter two species by the 4-merous flowers, shorter and narrower calyx lobes, smaller corolla lobes, and smaller anthers and style.

**2. *Ardisia pseudocuspidata*** Pipoly & Ricketson, sp. nov. TYPE: Panama. Darién: SW ridge leading to Alturas de Nique on the Colombian border, 900 m, 28 Dec. 1980 (fl), *R. Hartman 12363* (holotype, MO; isotypes, LL, PMA not seen). Figure 3.

Haec species propter rhachides inflorescentiarum angulatas et longitudinaliter interamulari-porcatas, laminam

foliarem membranaceam (non chartaceam), ad basim obtusam vel rotundatam (nec cuneatam), necnon lobulos calycinis  $1\text{--}1.3 \times 0.9\text{--}1.1$  (non  $1.3\text{--}1.5 \times 1.1\text{--}1.3$ ) mm *A. cuspidatae* valde arcte affinis, sed ab ea lobulis corollinis  $3.2\text{--}3.5 \times 1.7\text{--}1.9$  (non  $2.3\text{--}2.6 \times 1.1\text{--}1.4$ ) mm, antheris  $1.8\text{--}2.0 \times 0.7\text{--}0.9$  (non  $1.4\text{--}1.6 \times 0.5\text{--}0.7$ ) mm, stylis  $2.9\text{--}3.2$  (non  $3.5\text{--}3.8$ ) mm longis, fructibus  $5.0\text{--}6.0$  (non  $3.5\text{--}4.5$ ) mm diametris, praeclare distat.

*Small trees* 3–4 m tall, to 9 cm diam. *Branchlets* slender, sharply angulate, 1–4 mm diam., densely and minutely furfuraceous-lepidote at least apically, usually glabrescent with age. *Leaves* with blades membranous, ovate to elliptic,  $4.3\text{--}8.7 \times 1.8\text{--}3.7$  cm, apically cuspidate, the acumen 7–14 mm long, basally obtuse to rounded, decurrent to petiole base, but not onto stem, prominently punctate and punctate-lineate, glabrous above, with scattered minute furfuraceous-lepidote indument below, the secondary veins 28 to 35 pairs, obscure to prominent above and below, the margins entire, flat; petioles slender, marginate, 3–5 mm long, glabrous above, densely and minutely furfuraceous-lepidote below. *Inflorescences* lateral and terminal, erect, pinnately to bipinnately paniculate,  $3\text{--}5 \times 3\text{--}4.5$  cm, pyramidal, shorter than the leaves, densely and minutely furfuraceous-lepidote, the branches loosely congested into 3- to 7-flowered corymbs; peduncles 0.3–0.6 cm long; inflorescence branch bracts unknown, early caducous; floral bracts caducous, membranous, ovate,  $0.6\text{--}1 \times 0.4\text{--}0.8$  mm, apically acute, conspicuously and prominently punctate and punctate-lineate, glabrous within, with scattered minute furfuraceous-lepidote indument without, the margins minutely erose, hyaline; pedicels slender, terete, 2.9–4.1 mm long, prominently punctate and punctate-lineate, densely and minutely furfuraceous-lepidote. *Flowers* 5-merous; calyx 1.6–1.8 mm long, the tube 0.4–0.6 mm long, the lobes ovate,  $1\text{--}1.2 \times 0.9\text{--}1.1$  mm, apically acute, conspicuously and prominently punctate and punctate-lineate, glabrous within, with scattered minute furfuraceous-lepidote indument without, the margins minutely erose, hyaline; corolla white, membranous, 4.4–4.7 mm long, the tube 1–1.2 mm long, the lobes lanceolate  $3.2\text{--}3.5 \times 1.7\text{--}1.9$  mm, apically acute, prominently punctate and punctate-lineate, glabrous, the margins entire; stamens 3.4–3.7 mm long, the filaments 2–2.2 mm long, the staminal tube 0.7–0.9 mm long, the apically free portion 1.1–1.3 mm long, prominently punctate and punctate-lineate, glabrous, the anthers free, oblong to lanceolate,  $1.8\text{--}2 \times 0.7\text{--}0.9$  mm, apically apiculate, basally cordate, the connective inconspicuously punctate and punctate-lineate; pistil 4.1–4.5 mm long, glabrous, the ovary ovoid, 0.7–0.9 mm long, the style 3.5–3.8 mm long, inconspicuously



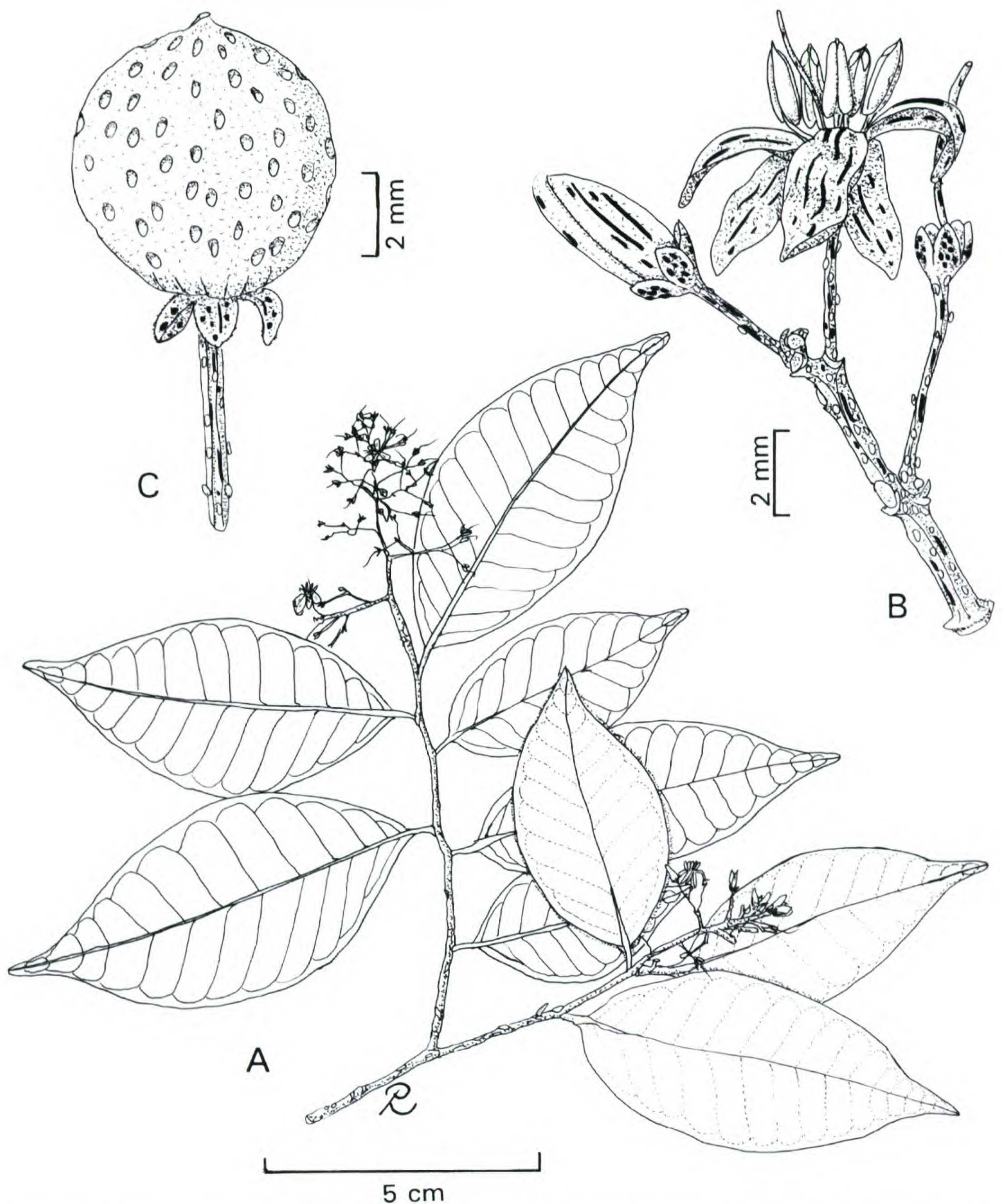


Figure 3. *Ardisia pseudocuspidata* Pipoly & Ricketson. —A. Flowering branch. —B. Detail of inflorescence. —C. Fruit. A & B drawn from the holotype, R. Hartman 12363 (MO); C from A. Gentry & A. Clewell 7082 (MO).

punctate and punctate-lineate, the ovules 38 to 47. *Fruits* globose, 5–6 mm diam., prominently punctate and punctate-lineate, glabrous.

*Distribution.* *Ardisia pseudocuspidata* is endemic to the province of Darién, Panama (belonging to the Chocó Floristic Province), near the Colombian border, from 800 to 1400 m elevation.

*Ecology and conservation assessment.* This species occurs along ridges in cloud and elfin forests. The high-altitude areas on the Panamanian-Colombian border are remote and might be safe from imminent destruction owing to civil unrest. The area lies within Darién National Park and has Katio National Park adjoining it on the Colombian

side, both of which afford further protection. The species is restricted to that portion of the Serranía del Darién that comprises Cerro Pirré and Nique, a mountain chain running from southwest to northeast and forming the border between Panama and Colombia. Therefore, we estimate the possible extent of occurrence for the species to be approximately 500 km<sup>2</sup> and the area of occupancy certainly less than that. Using the IUCN (2001) Red List Criteria, *Ardisia pseudocuspudata* is Endangered, EN B2aD, because the area of occupancy is estimated to be less than 500 km<sup>2</sup> (B2), the species is known from less than five locations (a), and the population size is estimated to be less than 250 mature individuals (D).

*Etymology.* The specific epithet refers to its similarity to *Ardisia cuspidata*.

*Paratypes.* PANAMA. **Darién:** Cerro Campamento, S of Cerro Pirré, 20–22 Mar. 1968 (fr), *J. Duke 15676* (MO, PMA not seen); summit of Cerro Pirré, 29 Dec. 1972 (fr), *A. Gentry & A. Clewell 7082* (LL, MO, PMA not seen).

Owing to its angulate inflorescence rachises and sharply angulate branchlets, membranous leaf blades obtuse to rounded basally, and calyx lobes from 1–1.3 × 0.9–1.1 mm, *Ardisia pseudocuspudata* is closely related to *A. cuspidata*. However, *Ardisia pseudocuspudata* is clearly separated from *A. cuspidata* by its large corolla lobes 3.2–3.5 × 1.7–1.9 (not 2.3–2.6 × 1.1–1.4) mm, larger anthers 1.8–2.0 × 0.7–0.9 (not 1.4–1.6 × 0.5–0.7) mm, longer styles 3.5–3.8 (not 2.9–3.2) mm long, and larger fruits 5.0–6.0 (not 3.5–4.5) mm in diameter.

Taxonomic revision of *Ardisia* subg. *Icacorea* also disclosed the necessity of making the following two combinations, synonymizations and typification.

**3a. *Ardisia furfuracella*** Standley subsp. **furfuracella**, Ann. Missouri Bot. Gard. 25: 832. 1938. TYPE: Panama. Chiriquí: valley of upper Río Chiriquí Viejo, 1300–1900 m, (fl), *P. & G. White 8* (holotype, F; isotypes A, LL neg. 1971-49, MO).

*Distribution.* *Ardisia furfuracella* subsp. *furfuracella* occurs throughout the Cordillera de Talamanca in the provinces of Cartago and Puntarenas, Costa Rica, to the province of Chiriquí, Panama, from 1300 to 2200 m elevation.

*Ecology and conservation assessment.* Subspecies *furfuracella* has an extent of occurrence nearing 24,000 km<sup>2</sup> and an area of occupancy of approximately 12,000 km<sup>2</sup>. The species is known to be locally common, but the populations are very fragmented as this subspecies specializes in the transition zone from montane wet forest to cloud

forest habitats. That transition zone is the upper limit for coffee cultivation and a number of other products, and therefore, the disturbance noted by Pipoly (*Pipoly 7603*) is likely to increase. We therefore consider this species to be Vulnerable, VUC1,C2ai, where we note that (C1) the population sizes are estimated to number fewer than 10,000 mature individuals and (C2) a continuing decline is inferred in numbers of mature individuals and (a) population structure is in the form of (i) no subpopulation estimated to contain more than 1000 mature individuals.

**3b. *Ardisia furfuracella*** Standley subsp. **veraguasensis** (Lundell) Pipoly & Ricketson, comb. et stat. nov. Basionym: *Ardisia veraguasensis* Lundell, Wrightia 5: 64. 1974. *Icacorea veraguasensis* (Lundell) Lundell, Phytologia 49: 352. 1981. TYPE: Panama. Veraguas: Caribbean slope above Río Primero Brazo, 5 mi. NW Santa Fe, 700–1200 m, 18–19 Mar. 1973 (fl), *R. Liesner 986* (holotype, LL; isotypes, GH, MO, PMA not seen).

*Ardisia caudatifolia* Lundell, Wrightia 5: 278. 1976. Syn. nov. *Icacorea caudatifolia* (Lundell) Lundell, Phytologia 49: 347. 1981. TYPE: Panama. Veraguas: along stream between Santa Fe & Escuela Agrícola Alto Piedras, without elev., 29 Aug. 1974 (fr), *T. Croat 27344* (holotype, LL, F neg. 55648; isotypes, MO, PMA not seen).

*Ardisia oerstediana* Lundell, Wrightia 6: 84. 1979. Syn. nov. *Icacorea oerstediana* (Lundell) Lundell, Phytologia 49: 350. 1981. TYPE: Panama. Veraguas: 0.6 mi. beyond Escuela Agrícola Alto Piedra, 730 m, 4 Apr. 1976 (fl), *T. Croat & J. Folsom 34055* (holotype, LL, F neg. 55678; isotypes, MO, PMA not seen).

*Distribution.* *Ardisia furfuracella* subsp. *veraguasensis* is known from Nicaragua southward to the province of Veraguas, Panama, from 100 to 1600 m elevation.

*Ecology and conservation assessment.* This subspecies occurs in open, windswept forest margins and has significant tolerance to drying and other disturbance. The extent of occurrence is 108,900 km<sup>2</sup>, with an area of occupancy of nearly 12,100 km<sup>2</sup> and with 60 collections known from 27 populations. There are no data regarding number of individuals per population, but all of the environments mentioned were disturbed ones. Therefore we must assume that the plant is rather resilient, and we would therefore classify it as of least concern, LC.

*Ardisia furfuracella* subsp. *veraguasensis* may be separated from subspecies *furfuracella* by its membranous (not chartaceous) leaf blades that are essentially glabrous below, except with scattered to

densely and minutely furfuraceous-lepidote scales along the midrib (not scattered furfuraceous-lepidote across the leaf below), the glabrous (not lepidote) pedicels, the larger calyx lobes  $1.4\text{--}1.6 \times 1.1\text{--}1.3$  (not  $0.9\text{--}1.2 \times 0.5\text{--}1$ ) mm, with larger corolla lobes  $4.4\text{--}4.6 \times 1.7\text{--}2.1$  (not  $2.9\text{--}3.2 \times 1.6\text{--}1.8$ ) mm, larger anthers  $2.2\text{--}3.1$  (not  $1.6\text{--}1.9$ ) mm long, and longer style  $4.7\text{--}5.3$  (not  $3.6\text{--}3.9$ ) mm long.

The type of *Ardisia caudatifolia* is qualitatively identical to the type of *A. veraguasensis*, differing only in its longer leaves and inflorescences. Likewise, the type of *A. oerstediana* is notable only for its large membranous leaf blades that are extremely bullate, and the inflorescences that are larger and much wider than those of the type of *A. veraguasensis*. In all other aspects the two are identical. The variation seen in the types of *Ardisia caudatifolia* as well as that observed in *A. oerstediana* fall well within the range seen across the species. We therefore see no support for their separation as species, and have thus placed *Ardisia veraguasensis* and *A. oerstediana* in synonymy with *A. furfuracella* subsp. *caudatifolia*.

We recognize *Ardisia furfuracella* subsp. *veraguasensis* as distinct from subspecies *furfuracella* based on its leaf blades, which are membranous (not chartaceous), essentially glabrous below, except sparsely to densely and minutely furfuraceous-lepidote along the midrib (not sparsely and minutely furfuraceous-lepidote below, the scales denser along the midrib), pedicels glabrous (not with scattered, minute furfuraceous-lepidote indument), calyx lobes  $1.4\text{--}1.6 \times 1\text{--}1.3$  (not  $0.9\text{--}1.2 \times 0.5\text{--}1$ ) mm; corolla lobes  $4.4\text{--}4.6 \times 1.7\text{--}2.1$  (not  $2.9\text{--}3.2 \times 1.6\text{--}1.8$ ) mm; anthers  $2.2\text{--}3.1$  (not  $1.6\text{--}1.9$ ) mm long; and styles  $4.7\text{--}5.3$  (not  $3.6\text{--}3.9$ ) mm long.

During our studies of a group of entities related to *Ardisia mexicana*, the need to lectotypify its synonym, *Ardisia compressa* var. *mexicana*, became apparent, and is accomplished herewith.

**4a. *Ardisia mexicana* Lundell subsp. *mexicana***, *Wrightia* 3: 77. 1963. *Gentlea mexicana* (Lundell) Lundell, *Wrightia* 5: 44. 1974. TYPE: Mexico. Jalisco: crest of ridge facing the Pacific, 10 mi. S of Autlán, ca. 5700 ft. [1737 m], 20 Aug. 1949 (fl), *R. Wilbur & C. Wilbur 2460* (holotype, LL; isotype, MICH).

*Ardisia compressa* Kunth var. *mexicana* Oersted, Vidensk. Meddel. Dansk Naturhist. Fören. Kjøbenhavn 1861: 125. 1862. TYPE: Mexico. Oaxaca: Prope Quatulco, without elev., Oct. 1842 (fl), *F. Liebmann 21* (lectotype, designated here, C).

*Icacorea jaliscensis* Lundell, *Phytologia* 53: 412. 1983. Syn. nov. *Ardisia jaliscensis* (Lundell) Lundell, *Phytologia* 61: 65. 1986, nom. inval. *Ardisia jaliscensis* (Lundell) Pipoly & Ricketson, *Sida* 18: 513. 1998. TYPE: Mexico. Jalisco: along road to Jirosto, ca. 10 km WNW of Purificación, ca.  $19^{\circ}44'N$ ,  $104^{\circ}42'W$ , 400 m, 11 Jan. 1979 (fr), *H. Iltis & M. Nee 1437* (holotype, LL-TEX; isotype, MEXU 2 sheets, US, WIS not seen).

In A. Oersted's (1862: 125) original description of *Ardisia compressa* var. *mexicana*, three collections were cited: "Cl. Liebmann hanc varietateum prope Quatulco et Mirador a mense Octobris in januarium usque florentem et juxta Colipa Martio fructificantem legit." Without a clear indication of a holotype, a lectotype must be selected. Unfortunately, the specimen from Quatulco is the only remaining Liebmann collection of this species at C where the Oersted types are housed. The Missouri Botanical Garden houses a duplicate of the Colipa collection, and no collection from Mirador can be located. Thus we hereby designate the *F. Liebmann 21* collection from Quatulco at C as the lectotype.

**Distribution.** *Ardisia mexicana* subsp. *mexicana* is restricted to the foothills of the Sierra Madre del Sur mountain range in the broad sense, from the state of Nayarit in the north to Oaxaca in the south, and in the foothills of the mountains of Veracruz, from 100 to 300 m elevation.

**Ecology and conservation assessment.** The extent of occurrence for this subspecies is approximately 48,000 km<sup>2</sup>, with an area of occupancy of less than 1000 km<sup>2</sup>, and collections made from only 15 locations. Label data from herbarium specimens indicate that the plant is rare in these localities, often at the lower margin of pine-oak forests, where access roads typically occur. We classify this species as Vulnerable, VU B2 bii, biii, biv, where B2 indicates that the area of occupancy is estimated to be less than 2000 km<sup>2</sup>, and there is a continuing decline observed and projected in the (bii) area of occupancy, (biii) quality of habitat, and (biv) number of locations or subpopulations. The populations from Nayarit have not been observed since 1957, and new collections coming to us from floristic projects in Mexico have not included any new material.

**4b. *Ardisia mexicana* Lundell subsp. *siltepecana*** (Lundell) Pipoly & Ricketson, comb. et stat. nov. Basionym: *Ardisia siltepecana* Lundell, *Wrightia* 4: 66. 1968. *Icacorea siltepecana* (Lundell) Lundell, *Phytologia* 49: 351. 1981. TYPE: Mexico. Chiapas: Cascada near Siltepec, 1600 m, 1 Mar. 1945 (fl), *E. Matuda 5161* (holotype, LL; isotypes, F, LL 2 sheets, MEXU).

*Distribution.* This subspecies is endemic to the southern portion of Chiapas, Mexico, from 200 to 1600 m elevation.

*Ecology and conservation assessment.* *Ardisia mexicana* subsp. *siltepecana* occurs along river banks in dry forests. Using the IUCN (2001) criteria we consider it endangered because its extent of occurrence is less than 5000 km<sup>2</sup>, it is known from fewer than five gatherings at separate locations, the area of occupancy is less than 500 km<sup>2</sup>, and the population size is estimated to number less than 2500 mature individuals, ENB1a, 2a.

This subspecies differs from *Ardisia mexicana* subsp. *mexicana* by its chartaceous (not membranous) leaf blades with scattered furfuraceous-lepidote scales over the entire surface (not restricted to the veins), the smaller calyx lobes 0.9–1.2 × 0.5–1 (not 1.4–1.6 × 1–1.3) mm, the smaller corolla lobes 2.9–3.2 × 1.6–1.8 (not 4.4–4.6 × 1.7–2.1) mm, the smaller anthers 1.6–1.9 (not 2.2–3.1) mm long, and the shorter styles 3.6–3.9 (not 4.7–5.3) mm long. Subspecies *siltepecana* is also restricted to dry forests instead of the humid habitats of subspecies *mexicana*.

*Acknowledgments.* We are grateful to the Missouri Botanical Garden (MO), to Gerrit Davidse (MO) as well as the *Flora Mesoamericana* Project, and the Fairchild Tropical Garden for their support of this inter-institutional research effort. Many thanks are due to Roy Gereau (MO) for reviewing the Latin diagnoses. The drawings were prepared by Jon Ricketson.

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